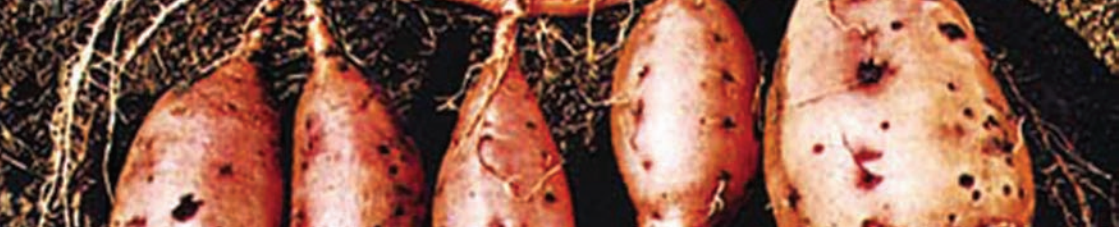

WEEVIL RESISTANT SWEETPOTATO THROUGH BIOTECHNOLOGY

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African sweetpotato weevils (SPW), *Cylas puncticollis* and *C. brunneus,* are a major threat to sweetpotato, which plays a vital role in food security and income generation for both the urban and rural poor in Sub-Saharan Africa (SSA). SPW can devastate sweetpotato production, including total crop loss. A socio-economic study undertaken by the International Potato Center (CIP) and national partners in Burundi, DR Congo (Kivu province only), Rwanda, and Uganda revealed that SPW cause an average annual yield loss of 20%. Methods, including breeding, for controlling this pest in SSA have not succeeded opening the door for using biotechnology and genetic engineering; making a transgenic sweetpotato. At least three proteins from *Bacillus thuringiensis* (Bt) were toxic to both SPW species at less than 1 ppm [Cry7Aa1, ET33/34, and Cry3Ca1]. Corresponding gene constructs were developed using sporamin and □ amylase promoters to express and accumulate high Bt protein levels in the storage root. Approximately one hundred transformed events from sweetpotato varieties (one variety from SSA), were produced by *Agrobacterium tumefaciens* transformation of petioles and somatic embryos. Gene expression from leaf tissues using qRT-PCR revealed up to 20X difference among events. Protein accumulation using DAS-ELISA and storage roots exhibited even larger variation between events. However, so far only 18 of the 90 events have produced storage roots which could be bioassayed. Most events accumulated Cry proteins below the LC_{50} level, two events accumulated Cry protein at the LC_{50} level and only one event accumulated Cry protein above the LC_{50} level (3 times the LC_{50} level). Bioassays using transgenic tissues infested with SPW larvae are on-going but preliminary results reflect low toxicity as expected based on Cry protein expression. Future steps include the screening of additional events, characterization of competitive binding of these Cry proteins and confined field trials of SPW- resistant events.